

Clinical Evidence Series

Impact of wearable wireless continuous vital sign monitoring in abdominal surgical patients: a before-after study



What's different

This study evaluated a wearable wireless continuous monitoring solution combined with proactive nursing assessment of vital-sign trends examining how continuous monitoring may influence care processes and postoperative outcomes.



Interpretation

Continuous monitoring using wearable wireless sensors was associated with a shorter hospital length of stay and fewer nurse-to-house-officer calls. Continuous monitoring prompted additional nursing assessments and therapeutic interventions.



Key takeaways

Wearable continuous monitoring with MEWS was associated with a half day lower median hospital stay. The observed difference occurred primarily among colorectal surgery patients, while other clinical outcomes were similar between groups.



Background

- Clinical deterioration on general surgical wards is often preceded by subtle changes in vital signs that may not be detected through intermittent monitoring
- Wearable wireless monitoring enables continuous assessment of physiologic trends and may support earlier identification of patient deterioration
- Evidence demonstrating meaningful improvements in postoperative outcomes remains limited



Study design and methods

- Single-center before-after study conducted in a 1,250-bed teaching hospital in the Netherlands
- 908 patients undergoing major abdominal surgery were included (714 controls; 194 continuous monitoring patients)
- Continuous monitoring was performed using Philips Healthdot integrated with Philips IntelliVue Guardian Solution while standard MEWS monitoring continued in both groups
- Heart rate and respiratory rate trends were reviewed proactively each nursing shift, with follow-up assessments and interventions performed as needed



Objectives

Evaluate the impact of wearable wireless continuous vital sign monitoring on clinical outcomes, care processes, and patient acceptability in adults undergoing major abdominal surgery.



Results



Length of stay:

Median hospital length of stay was significantly shorter in continuously monitored patients (5.0 vs. 5.5 days; $p = 0.012$).



Nursing actions: Nurse-to-house-officer calls decreased from 15.3% to 7.7% ($P = 0.007$) while continuous monitoring prompted 109 additional nursing activities in 35% of monitored patients.



Patient experience: 83% of patients considered the monitoring acceptable, 89% agreed that the patch was comfortable to wear, 71% reported feeling safer, and 93% indicated that they would wear the device again.